



Forecasting Clinical Outcomes in Ghanaian District Hospitals: A Time-Series Analysis

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Abstract

Clinical outcomes in Ghanaian district hospitals are influenced by various factors including patient demographics, healthcare resources, and treatment protocols. A time-series analysis was conducted using data from six district hospitals in Ghana. The model incorporates autoregressive integrated moving average (ARIMA) methodology with uncertainty quantified through robust standard errors. The ARIMA model forecasts a trend of approximately -2% annual decline in hospital readmission rates, suggesting improvements are needed to stabilise outcomes. This study demonstrates the effectiveness of time-series forecasting for assessing clinical performance within district hospitals. The proposed method provides insights into resource allocation and policy development. District health authorities should focus on enhancing patient care protocols and increasing healthcare staff training to mitigate readmission rates. clinical outcomes, Ghanaian district hospitals, time-series analysis, ARIMA model Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_{it}$, and uncertainty reported using confidence-interval based inference.

Keywords: *Ghana, Geographic Medicine, Time-Series Analysis, Forecasting Models, Public Health Systems, Epidemiology, Data Mining*

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